

REMARKS

Applicants request favorable reconsideration of this application in view of the foregoing amendments and the following remarks. Claims 1 and 7-14 were pending in the application and were rejected in the Office Action. By way of this amendment, Applicants have: (a) canceled independent claims 1, 9, and 10, without prejudice or disclaimer; (b) added new independent claims 15, 17, and 19; and (c) added new dependent claims 16, 18, and 20. No new matter is presented. Accordingly, claims 7, 8, and 11-20 are respectfully presented for further consideration.

1. Rejection of Claims 1 and 7-14 under 35 U.S.C. § 103(a)

The Examiner rejected claims 1 and 7-14 under 35 U.S.C. § 103(a) as allegedly being obvious when considering U.S. Patent No. 5,433,676 ("Abe") in view of U.S. Patent No. 4,819,187 ("Yasue"). Preliminarily, as independent claims 1, 9, and 10 have been canceled herein, without prejudice or disclaimer, this rejection will be addressed, and respectfully traversed, with respect to new independent claims 15, 17, and 19, along with dependent claims 7, 8, and 11-14.

Claim 15 (*i.e.*, the claim from which claims 7 and 8 depend) recites a control apparatus for a vehicle that is provided with an engine and an automatic transmission connected to the engine. The control apparatus includes, among other possible things (*italic emphasis added*):

- a detection device that detects an operating state of the transmission;
- a torque regulating mechanism that regulates a torque of the engine; and
- a controller that is configured to:

- determine whether a rapid torque reduction or a smooth torque reduction is required based on the operating state of the transmission,

- perform a first torque reduction control when the rapid torque reduction is required*, the first torque reduction control being a control whereby the torque of the engine is reduced rapidly and temporarily by:

- (a) an ignition timing delay of the engine, and/or

- (b) a reduction of a fuel amount supplied to the engine,

- perform a second torque reduction control when the smooth torque reduction is required, the second torque reduction control being a control whereby the torque of the engine is reduced continuously, and more smoothly than in the first torque reduction control by reducing an engine intake air amount, and

- when the rapid torque reduction is required and the first torque reduction control is performed, switch to the second torque reduction control from the first torque reduction control, if the*

first torque reduction control continues for a predetermined period of time.

Similarly, claim 17 (*i.e.*, the claim from which claims 11 and 12 depend) recites a control apparatus for a vehicle that is provided with an engine and an automatic transmission connected to the engine. The control apparatus includes, among other possible things (*italic emphasis added*):

- a detection device that detects an operating state of the transmission;
- a torque regulating mechanism that regulates a torque of the engine;
- means for determining whether a rapid torque reduction or a smooth torque reduction is required based on the operating state of the transmission;
- means for performing a first torque reduction control when the rapid torque reduction is required*, the first torque reduction control being a control whereby the torque of the engine is reduced rapidly and temporarily by:
 - (a) an ignition timing delay of the engine, and/or
 - (b) a reduction of a fuel amount supplied to the engine;
- means for performing a second torque reduction control when the smooth torque reduction is required, the second torque reduction control being a control whereby the torque of the engine is reduced continuously, and more smoothly than in the first torque reduction control by reducing an engine intake air amount; and
- means for, when the rapid torque reduction is required and the first torque reduction control is performed, switching to the second torque reduction control from the first torque reduction control, if the first torque reduction control continues for a predetermined period of time.*

In addition, claim 19 (*i.e.*, the claim from which claims 13 and 14 depend) recites a control method for a vehicle that is provided with an engine, an automatic transmission connected to the engine, a detection device that detects an operating state of the transmission, and a torque regulating mechanism that regulates a torque of the engine. The control method includes, among other possible steps (*italic emphasis added*):

- determining whether a rapid torque reduction or a smooth torque reduction is required based on the operating state of the transmission;
- performing a first torque reduction control when the rapid torque reduction is required*, the first torque reduction control being a control whereby the torque of the engine is reduced rapidly and temporarily by:
 - (a) an ignition timing delay of the engine, and/or
 - (b) a reduction of a fuel amount supplied to the engine;
- performing a second torque reduction control when the smooth torque reduction is required, the second torque reduction control being a control whereby the torque of the engine is reduced continuously, and more smoothly than in the first torque reduction control by reducing an engine intake air amount; and
- when the rapid torque reduction is required and the first torque reduction control is performed, switching to the second torque reduction control*

from the first torque reduction control, if the first torque reduction control continues for a predetermined period of time.

For at least the following reasons, the combination of Abe and Yasue fails to teach or suggest the control apparatuses recited in claims 15 and 17 or the control method recited in claim 19.

According to the present invention, when the rapid torque reduction is required, generally only the first torque reduction control is performed and when the smooth torque reduction is required, generally only the second torque reduction control is performed. However, if the first torque reduction control is selected and continues for a predetermined period of time, the exhaust catalyst may deteriorate. In response to this potential for catalyst deterioration, the present invention switches the control from the first torque reduction control to the second torque reduction control. *See ¶ [0053], Fig. 4 (steps S12-S15).*

This switch in control is reflected in the above-italicized limitations in claims 15, 17, and 19, which recite that the instant invention: (a) selects between a first torque reduction control (*i.e.*, rapid torque reduction) and a second torque reduction control (*i.e.*, smooth torque reduction) based on whether the rapid torque reduction or the smooth torque reduction is required; and (b) switches to the second torque reduction control from the first torque reduction control, even when the rapid torque reduction is required and the first torque reduction control is performed, if the first torque reduction control is performed for a predetermined period of time. As hereafter explained, neither Abe nor Yasue teaches or suggests this aspect of claims 15, 17, and 19.

Abe: Abe discloses changing between two torque reduction controls, one which cuts the fuel supply to half of the four cylinders and one which cuts the fuel supply to all four cylinders. Moreover, these controls are performed in stages. In other words, when the load level is: (a) low, a fuel-cut to half of the four cylinders is performed; and (b) high, a fuel-cut to half of the four cylinders is performed and, subsequently, a fuel-cut to the remaining cylinders is performed. *See, e.g.*, col. 31, lines 40-59. In light of this understanding, it may appear, at first glance, that Abe's fuel-cut to half of the cylinders is analogous to the second torque reduction control (*i.e.*, smooth torque reduction) recited in claims 15, 17, and 19 and that Abe's fuel-cut to all of the cylinders is analogous to the first torque reduction control (*i.e.*, rapid torque reduction) recited in claims 15, 17, and 19. Such analogies, however, fail to account for the other limitations of claims 15, 17, and 19. Specifically, although Abe discloses switching from the half cylinder fuel-cut (*i.e.*, second torque reduction control) to the all cylinder fuel-cut (*i.e.*, first torque reduction control), Abe does not teach or suggest switching from the all cylinder fuel-cut (*i.e.*, first torque reduction control) to the half

cylinder fuel-cut (*i.e.*, second torque reduction control). As a result, Abe fails to teach or suggest “switching to the second torque reduction control from the first torque reduction control,” as above-italicized in claims 15, 17, and 19.

Yasue: Although Yasue, as the Examiner indicates, teaches simultaneously employing a combination of torque reduction techniques (*e.g.*, adjusting the fuel injection flowrate and the air intake amount – *see* col. 15, line 62 – col. 16, line 4), Yasue fails to cure the previously described deficiencies of Abe.

As the combination of Abe and Yasue fails to teach or suggest at least the above-italicized limitation of independent claims 15, 17, and 19, the combination can not be used to reject these claims, or any claim dependent thereon, under 35 U.S.C. § 103(a). Moreover, as claims 7 and 8 depend from claim 15, as claims 11 and 12 depend from claim 17, and as claims 13 and 14 depend from claim 19, each of these dependent claims is also allowable over Abe and Yasue, without regard to the other patentable limitations recited therein. Accordingly, the combination of Abe and Yasue can not be used to reject claims 7, 8, 11-15, 17, and 19 under 35 U.S.C. § 103(a).

2. New Claims 16, 18, and 20

New claims 16, 18, and 20, which respectively depend from claims 15, 17, and 19, recite that the switch to the second torque reduction control from the first torque reduction control is configured to prevent damage to an exhaust catalyst. Support for this limitation is provided, *e.g.*, in ¶ [0053] of the instant application.

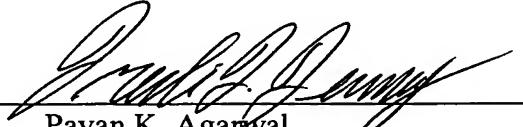
CONCLUSION

For the aforementioned reasons, claims 7, 8, and 11-20 are now in condition for allowance. A Notice of Allowance at an early date is respectfully requested. The Examiner is invited to contact the undersigned if such communication would expedite the prosecution of the application.

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